

Application No. 10/561,106
Amendment Dated June 7, 2007
Reply to Office Action dated April 30 2007
Attorney Docket No. 1469-053129

AMENDMENTS TO THE SPECIFICATION

Please replace the paragraph beginning on line 17 on page 1 with the following amended paragraph:

In order to be able to avoid gluing, a plug-in profile for a panel is known from printed publication WO 96/27721 which, first of all, comprises groove grooves and tongues in the known manner. Furthermore, every tongue has on a top and/or bottom side at least one continuous protruding locking element. Every groove is provided with furrows such that the protruding locking element arrives in the corresponding furrow after two panels have been plugged together. An adhesive-free connection between two panels which is effected by positive fit is thus created. The use of adhesive is not necessary to assemble panels to form a floor or wall covering. Of course, it is nevertheless possible and in some cases – as in the present invention – advantageous to use adhesive additionally.

Please replace the paragraph beginning on line 29 on page 15 bridging page 16 with the following amended paragraph:

In the figure 2c, two boards 1 and 2 having laterally mounted locking means are shown. The locking means connect the boards 1 and 2 without adhesives. According to figure 2c, the boards 1 and 2 are connected or interlocked by positive fit in a perpendicular direction relative to the surface 3 of the boards 1 and 2 as well as in a parallel direction relative to the surface 3 of the board. Furthermore the two boards 1 and 2 are interlocked in a perpendicular direction relative to the common connecting joint 4. A displacement of the board 1 relative to the board 2 in a parallel direction relative to the common connecting joint 4 is possible in a limited extent, as will later be explained in connection with figure 1.

Please replace the paragraph beginning on line 4 on page 16 with the following amended paragraph:

In the initial position or intermediate position, there may be a play "Δ" at the common connecting joint 4. Because of the play, the boards can be pulled apart a little (corresponding to the size of the play), namely in a perpendicular direction relative to the common connecting joint 4 and parallel to the surface 3. The locking elements according to figure 2b are made in such a way that, starting from an initial position, a final position in which there is

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The establishment of the connection is illustrated by means of the figures 2a to 2c. First, the new board 2 must be positioned over the laid board 1 such that the two overlap by around 1/3rd of the length of the board. Then, the new board 2 is lowered such that the perpendicular tongue 9 can be lowered into the corresponding perpendicular groove 7 (figure 2b). This is possible in spite of the ~~lateral groove tongue connection 5, 6~~ connection between the horizontal lateral groove 5 and the lateral tongue 6, since the perpendicular groove-tongue-connection is wedge-shaped. The common connecting joint 4 at this point in time still has a play "Δ".

Please replace the paragraph beginning on line 31 on page 18 with the following amended paragraph:

In figure 2b, the second board 2 is shifted along the common connecting joint 4, the joint inevitably being closed due to the wedge-shaped faces of the connection between the perpendicular groove tongue connection 9, 7 groove 7 and perpendicular locking element 9.

Please replace the paragraph beginning on line 33 on page 18 bridging page 19 with the following amended paragraph:

In figure 2c, the faces now adjoin intimately, i.e., over their whole length. The two boards are now fixed in a positive fit in all axes with the exception of a backward displacement along a common joint 4.

Please replace the paragraph beginning on line 3 on page 19 with the following amended paragraph:

Figure 3 now illustrates the laying of a flooring with the panels according to the invention. The boards that are already laid are marked 1' and 2. The connecting common joints 4 at the end faces are effected by the lowering and displacing according to the invention along the common joint 4, while the longitudinal connecting joint 4' can be effected by bringing the boards closer in the plane, for example, by means of a snap-in or snap-together connection.

Please replace the paragraph beginning on line 11 on page 19 with the following amended paragraph:

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no play between the boards 1 and 2 ~~or panels~~ is reached by displacement within a plane parallel relative to the common connecting joint. Furthermore, the locking elements according to figure 2b are made in such a way that the board 2 can be lifted in a perpendicular direction in the initial position shown, i.e., that no perpendicular locking has yet taken place. This is not possible anymore in the intermediate position.

Please replace the paragraph beginning on line 17 on page 16 with the following amended paragraph:

Figure 1 shows two boards according to the invention before they are brought into the initial position. The first board 1 which has already been laid has at its right side edge the locking elements 4, ~~5, 7, 18~~ comprising horizontal lateral groove 5, perpendicular groove 7, and second locking element 18. These substantially comprise a perpendicular groove 7 extending in a perpendicular direction relative to the surface 3 of the board which groove is limited by lateral wall surfaces 11 and 10. Towards the left, i.e., in the direction of the interior of the boards, the perpendicular groove 7 merges into a horizontal lateral groove 5 which thus permits an undercut under the board's surface 3. Thus, the bottom of the perpendicular groove 7 together with the groove trough of the horizontal lateral groove 5 in this case forms a common flat surface 51.

Please replace the paragraph beginning on line 29 on page 16 bridging page 17 with the following amended paragraph:

Furthermore, the lateral boundary wall surface 11 of the perpendicular groove 7 at the same time forms the ~~bottom of the groove boundary~~ of the lateral groove 5. On the other side, the perpendicular groove 7 is limited by [[a]] lateral wall surface 10. This wall surface 10, just like the corresponding lateral wall surface 16 of the second board 2, has the special feature that it does not run parallel to the joint 4 which ~~form~~ forms the visible narrow side of the boards 1 and 2 and which is defined by the encounter of the ~~walls~~ wall surfaces 12 and 13 formed perpendicular from the board surface 3 of the boards. Thus, the ~~walls~~ lateral wall surfaces 10 and 16 have the special feature that they are not formed like all other millings with an angle of 90° to the longitudinal edge of the panel.

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Please replace the paragraph beginning on line 4 on page 17 with the following amended paragraph:

According to the invention, a comparatively very great snap-together height and an optimal angle (90° to the surface of the board or dovetail-like) of the lateral ~~walls~~ wall surfaces 16, 10 can be realized at a small thickness, without the occurrence of compression forces, shear forces, splitting forces or bending forces. The snap-together height is the height of the ~~walls~~ lateral wall surfaces 16 and 10 that are in contact with each other. The second board 2 has corresponding connecting elements locking element 9, lateral tongue 6, and second perpendicular groove 17. A perpendicular locking element 9 leads downwards away from the surface 3 of the board, which perpendicular locking element 9 can get into the perpendicular groove 7 of the first board 1 similar to a tongue, when the second board 2 is lowered onto the first board 1, the two boards overlapping to about $1/3^{\text{rd}}$ of the length of the common joint 4. The width of the perpendicular locking element varies wedge-like over the length of the board. Its course is also adapted to the wedge-shaped course of the lateral wall surface 10 of the perpendicular groove 7 of the first board, so that the respective respective lateral ~~walls~~ wall surfaces 10 and 16 serve as gliding surfaces during the displacement of the two boards along the common joint 4. The wedge-shape makes the pushing together of the boards with great force.

Please replace the paragraph beginning on line 22 on page 17 with the following amended paragraph:

In order to make a lowering of the two boards into the initial position possible it is necessary that the width of the perpendicular locking element 9 of the second board 2 at the rear end of the end of the board 2 is smaller than the width measured between the lateral ~~walls~~ wall surfaces 13 and 10 of the perpendicular groove 7 in the front third of the first board 1.

Please replace the paragraph beginning on line 28 on page 17 with the following amended paragraph:

The second board 2 also has, as locking element 9 that has an effect in the vertical direction, a lateral tongue 6 that has an effect in the parallel direction relative to the surface 3 of the board. The bottom side of the lateral tongue 6 together with the bottom side of the

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perpendicular locking element 9 forms a flat bottom surface 61. The top side of the lateral tongue 6 is slightly chamfered just like the upper groove cheek of the horizontal lateral groove 5 of the lower board 1 in order to facilitate an introduction of the lateral tongue 6 into the horizontal lateral groove 5. Thus, lower manufacturing tolerances must be adhered to. These chamferings can be seen more clearly in figures 6 to 8.

Please replace the paragraph beginning on line 1 on page 18 with the following amended paragraph:

These chamferings also have advantages with regard to production technique. ~~For the~~ The milling spindles can be tilted and can thus use the space that has become available because of the chamferings as room for maneuvering. Thus, the ~~walls~~ lateral wall surfaces 10 and 16 are not damaged during the run since the milling need not take place in direct proximity to the ~~walls~~ lateral wall surface 10 and corresponding lateral wall surface 16.

Please replace the paragraph beginning on line 8 on page 18 with the following amended paragraph:

Furthermore, these chamferings have the advantage that the lateral end of the lateral tongue 6 need not contact the lateral wall surface 11 in the bottom of the groove, but rather is clamped wedge-like between the groove cheeks of the horizontal lateral groove 5. Because of the thus increased contact area, a particularly strong connection is achieved.

Please replace the paragraph beginning on line 14 on page 18 with the following amended paragraph:

A second perpendicular groove 17 extends perpendicularly upwards from the perpendicular locking element 9 and is able to receive the second locking element 18 of the lower board. By providing a plurality of ~~groove-tongue-connectors~~ groove-tongue connections, more contact ~~areas~~ surfaces, for example 12, 13, 10, 16, 11, 15, are provided, whereby the connection is made more stable and whereby, in particular, the common joint 4 can be closed free of play. This is then also secure if moments are applied.

Please replace the paragraph beginning on line 22 on page 18 with the following amended paragraph:

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As explained under figure 2a, the board 1 that is to be newly laid is lowered, offset relative to the laid board 2, at its short end face so that the two locking means ~~9 and 7 (perpendicular locking element 9 and perpendicular groove 7)~~ of the boards can interlock. While the newly laid board 1 is displaced along the ~~lateral connecting common~~ joint 4 towards the already laid boards 1', the ~~lateral connecting common~~ joint 4 closes. At the same time, more or less as a byproduct, a snap-together connection is effected by the connecting joint 4' at the longitudinal sides 4'. Thus, the lockings of joints 4, 4' at the end faces and at the longitudinal sides are effected at the same time by the displacement procedure.

Please replace the paragraph beginning on line 29 on page 19 with the following amended paragraph:

Figure 4 shows a detailed view of the connecting means locked in the final position. Here, the edge is shown where the perpendicular locking element 9 has the maximum width and where the second locking element 18, which is also wedge-shaped, has the minimal width. The aforementioned elements contact each other along a sliding surface formed by the ~~perpendicular walls lateral wall surfaces~~ 10 and 16 that run in a wedge shape over the width of the board. The view shown therefore corresponds to a front view of the boards from figures 1 and 2.

Please replace the paragraph beginning on line 2 on page 20 with the following amended paragraph:

The contour of the non-visible lateral ~~walls~~ wall surfaces 10', 16' in the rear area of the board is indicated as a dotted line. The distance between the drawn lateral wall surface 10 and the indicated wall surface 10' therefore is the greatest possible play " Δ " around which the boards can be moved perpendicular to the common joint 4. The ~~perpendicular walls lateral wall surfaces~~ 12 and 13 that abut in the area of the common joint 4 therefore can maximally have this distance " Δ ". Furthermore, the play " Δ " is dimensioned such that it is larger than the length of the lateral tongue 6 protruding at the perpendicular ~~eonnecting~~ locking element 9 in order to make a lowering of the perpendicular ~~eonnecting~~ locking element 9 into the perpendicular groove 7 possible in the final position. Thus, the ~~laterally mounted lateral~~ tongue 6 is shorter than the play that can occur maximally at the common joint.

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Please replace the paragraph beginning on line 14 on page 20 with the following amended paragraph:

The invention can be formed as in the embodiment according to scale if the length of the lateral groove 6 5 amounts to 2 mm, the maximal width of the perpendicular groove 7 to 8.7 mm and its minimal width 5.8 mm, so that a play of 2.9 mm is the result. The maximum and minimum width of the second perpendicular locking element therefore amounts to 6.7 mm and 3.8 mm. A free length of 12.5 mm for the lower lip formed from the perpendicular groove 7 and the perpendicular second locking element 18 is the result. A length of the lateral tongue 6 of 2 mm for the vertical locking produces a great closing strength and secure locking that is not achieved in known panels.

Please replace the paragraph beginning on line 25 on page 20 with the following amended paragraph:

As regards dimensioning and reference numerals, figure 5 corresponds to figure 4, however, the lateral ~~walls~~ wall surfaces 10 and 16 that serve as sliding areas are undercut similar to a dovetail so that a tensile force is exerted upon the connection. Thus, the two lateral wall surfaces 10, 16 hook together so that a downward deflection is not possible even if strong bending moments are exerted on the connections.

Please replace the paragraph beginning on line 32 on page 20 bridging page 21 with the following amended paragraph:

The further exemplary embodiment from figure 6 also corresponds to figure 4 as regards dimensioning and reference numerals, however, an additional lateral tongue 61 6A is provided on the first board 1 for reaching into an additional lateral groove 51 5A in the second board 2. In design and function, they correspond to the lateral horizontal tongue 6 or the horizontal lateral groove 5 already described above of the corresponding other boards 2, 1. The additional groove-tongue-connection 51, 61 5A, 6A on the bottom side of the boards prevents the lower groove cheek evading the lateral groove 5 under tensile stress. The lock against an offset in height is therefore effected twice.

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Please replace the paragraph beginning on line 6 on page 21 with the following amended paragraph:

It can further be seen in figure 6 that the lateral end of the lateral tongue 6 does not contact the lateral wall surface 11 in the bottom of the lateral groove 5 but is clamped wedge-like between the groove cheeks of the lateral groove 5. In all, it is found that in this embodiment the connected boards 1, 2 have a common course of the profile that is substantially point-symmetric, at least in the area of the horizontal tongues 6, 6A and grooves 5, 5A.

Please replace the paragraph beginning on line 13 on page 21 with the following amended paragraph:

The size of the smallest cross section, via which the perpendicular locking element 9 ~~respectively and the perpendicular~~ second locking element 18 ~~is connected~~ connect with the upper lip of the second board 2 respectively with the upper lip of the first board 1, determines the total strength of the connection in all exemplary embodiments. This area is sheared off when the connection is put under stress until breaking. If the cross section represented in figure 6 by a measure of length A is made larger, then the connection becomes stronger.

Please replace the paragraph beginning on line 22 on page 21 with the following amended paragraph:

The concrete dimensioning for a connection produced according to figure 6 can be seen from figures 7 and 8. The value for measure A is therefore [[--]] dependent on the course of the ~~wedge surface lateral wall surfaces~~ 10 and 16 or 10' and 16' ($5.25-1=4.25$ mm or $3.75-1=2.75$ mm). For the panels and thicknesses specified according to the invention, a value of 2-10 mm, preferably 2.5-7 mm, and particularly preferred, 2.5-5.5 mm was found.